Technical Disclosure Commons

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AUTOMATED BUILD UNIT SAFETY AND DEBRIS COVER

HP INC

AUTOMATED BUILD UNIT SAFETY AND DEBRIS COVER

Abstract

A Mechanism for automatically applying a flexible safety and debris shield to a build unit in a 3D printing system when the build unit is actuated autonomously.

Description

In the typical operation of an HP MJF 3D printer an operator typically manually removes the build unit, and applies a rigid cover allowing it to cool safely outside the printer. When automating the process, it is too cumbersome and expensive to build a mechanism to add this protective cover. It is undesirable for the build unit to be allowed to cool uncovered, as when it is removed from the printer the build unit print bucket is exposed. Powder in the print bucket is hot and may be a hazard to workers while it cools. Additionally, the print bucket powder being exposed risks contamination of the exposed powder bucket, as well as powder from the build bucket contaminating the surrounding environs.

Thus, a flexible cover which is easily and automatically applied using the existing motion of the build unit was developed. The flexible cover consists of a flexible sheet of material with a clip at one end and low force retainers at the other (Fig 1). In our instantiation the flexible cover is a textile, however this could be comprised of any flexible material such as a thin plastic or elastomer or a series of jointed plates of many different materials. Additionally, the low force retainers are magnets in our instantiation but can be any number of low force mechanical retainers such as Velcro or snaps.

After the build unit is inserted into the unit the cover is put into place by attaching the clip to the build unit and the low force retainers to the printer structure (Fig 2). When the unit is ejected the flexible cover is pulled over the top of the build unit and when it has covered the unit completely the low force attachment features detach from the printer and swing down onto the side of the build unit where they hold the cover in place (Fig 3).

Finally, this instantiation works with a single unit. However, by staging covers and using a hook that moves out of the build unit's way when inserted, but hooks on ejection one can use this same concept to cover multiple build units if desired/required.

Thus, the cover allows the application of a cover without human intervention, removes a safety hazard by covering hot powder, prevents contamination of the build powder, and prevents workspace contamination in a simple and inexpensive manner.

Figure 1

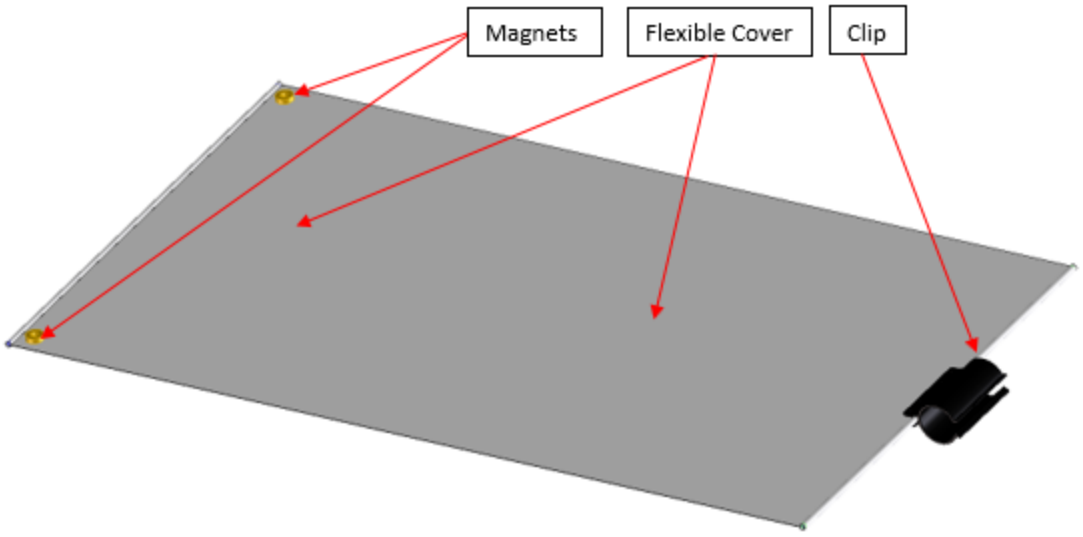


Figure 2

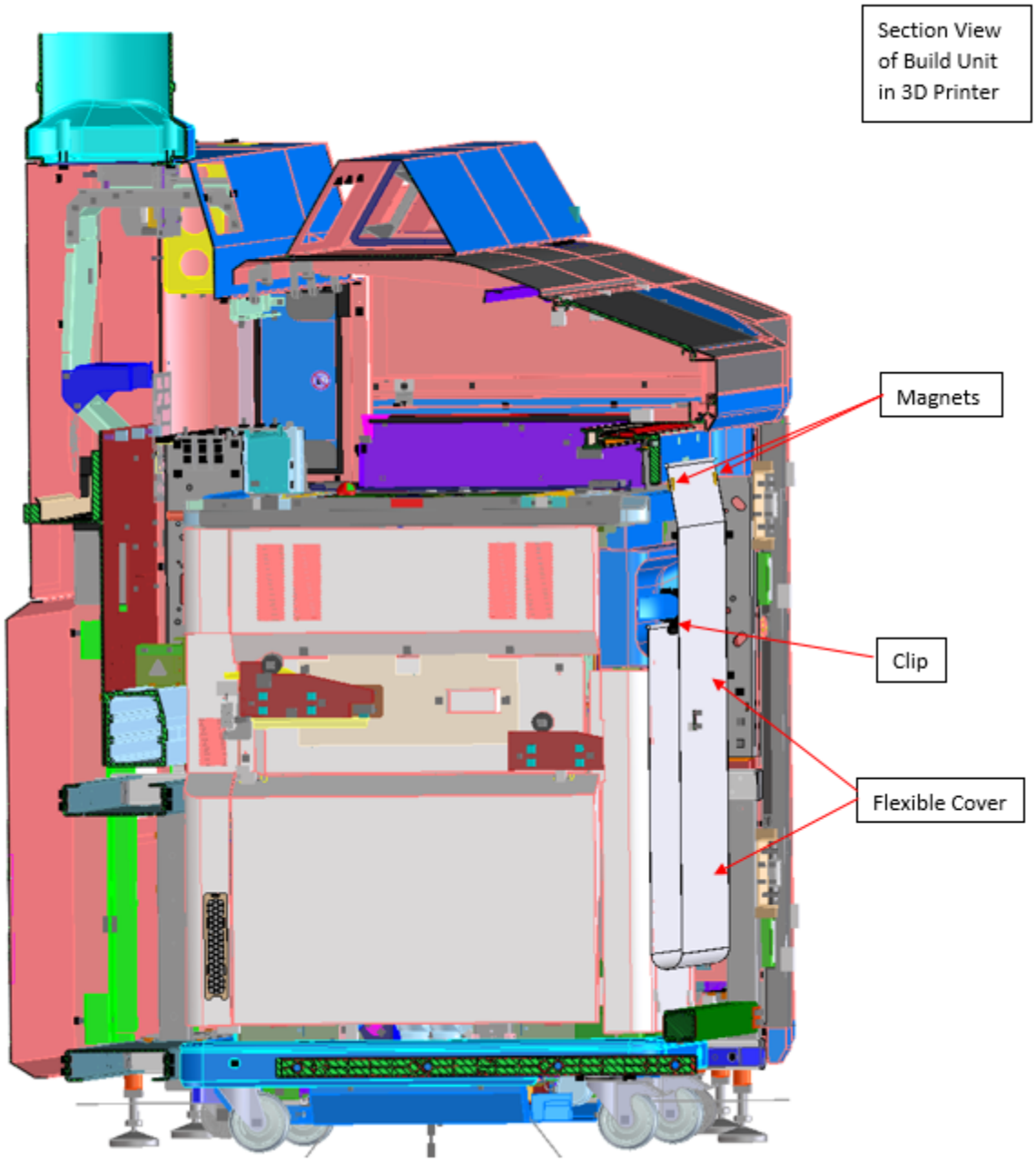
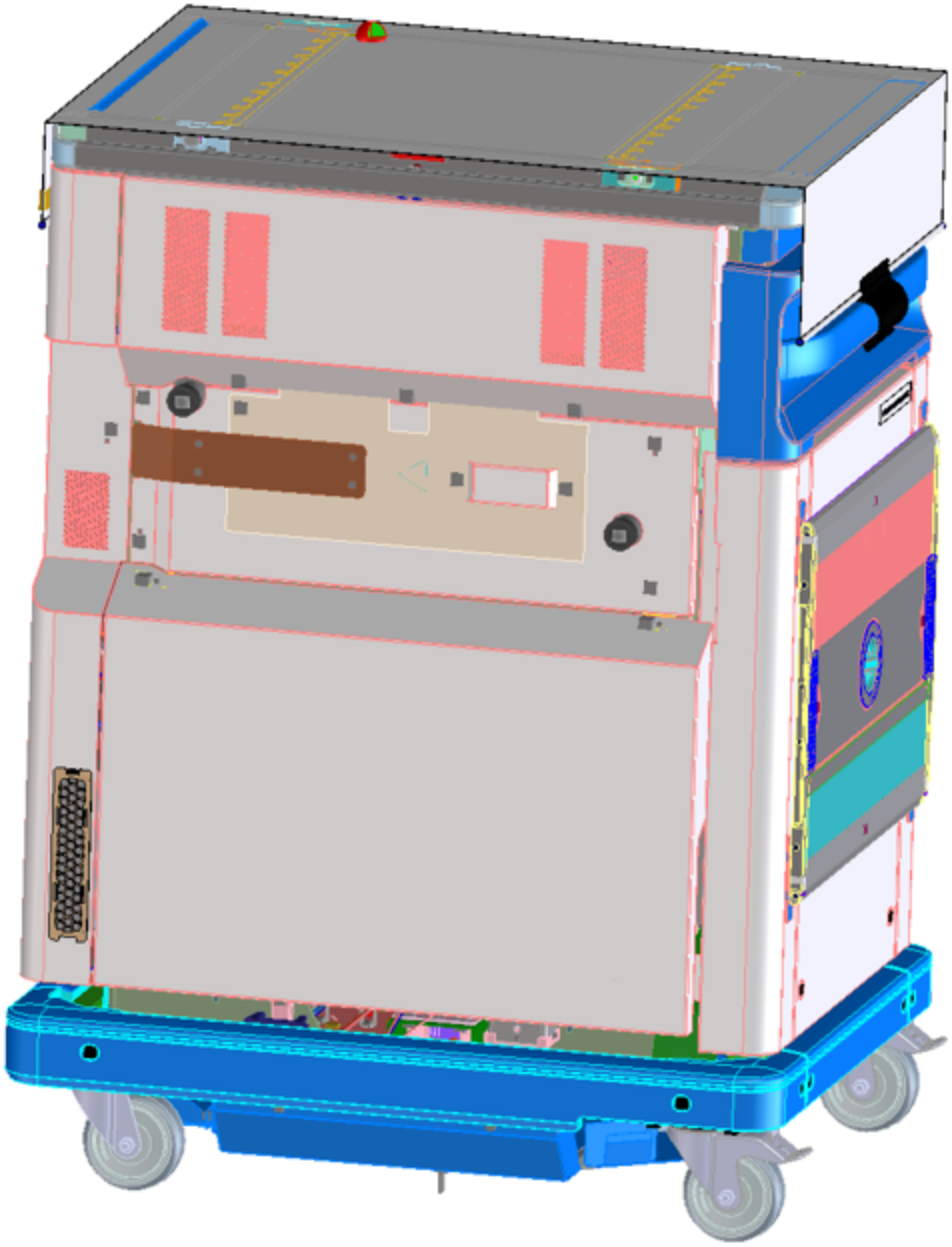

Section View of Build Unit in 3D Printer
Magnets
Clip
Flexible Cover

Figure 3



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